

REMARKS

Claims 1-23 and 53-100, previously withdrawn from consideration pursuant to a restriction requirement, have been canceled in the present application. At Applicant's discretion these claims may be presented for examination in a continuing application.

Claim 24 has been amended to emphasize distinguishing characteristics of the catalyst produced by the compositions and methods of the present invention. Support for the amendments can be found in paragraphs [0048], [0049] and [0096] regarding the amendment at Claim 24(C) and paragraph [0055] regarding the amendment at Claim 24(D), of the application as originally filed. Entry of the amendments and reconsideration of the claims are respectfully requested.

Claims 24-52 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. 4,500,424 to *Simpson, et al.* (hereinafter "*Simpson*"). Although not explicitly stated in the present Office Action, the current rejection appears to be over *Simpson* alone, as the prior rejection over *Simpson* in view of U.S. 3,287,280 to *Colgan, et al.* has not been reiterated.

In rejecting claims 24-52 in the present Action, the Office states that it "considers that the components of the composition as set forth in the instant claims do not differ substantially from those of the *Simpson*," and that "the main difference between the claimed composition and that of the references is the claimed requirement that the Group VIII impregnant be insoluble in water." (Action, p.3, emphasis supplied)

Applicant takes exception to characterization by the Office of a single characteristic as being the "main difference." Applicant has repeatedly emphasized that there are several differences in the composition and method of preparing

the catalyst, all of which result in a measurably improved catalyst.

Additionally, Applicant notes that the above statement regarding substantiality of the differences implies that the Office recognizes that there are differences between the claims and the disclosure of *Simpson*, but that the Office doesn't view the differences as being sufficiently "substantial." However, the significance of the differences between the claims and the *Simpson* disclosure should be measured not by a comparison of the language of the claims and the reference, but instead having acknowledged that there is a difference, considering what effect that difference causes in the resulting catalyst. Recognizing that the catalytic art is unpredictable, even small differences should not be dismissed if such differences produce significant effects. In the present case, significant catalyst improvements have been recorded not only as reported in the application as filed, but also in the literature, B. Lakhnpal *et al.*, "Upgrading Heavy Oils With New Catalyst Technology," *Petroleum Technology Quarterly*, 2004, 9, 5. (copy enclosed for reference)

It is particularly noteworthy that the journal reference was co-authored by the inventor and purchasers of the catalyst produced by the claimed technology, since the customer was free to obtain any available catalyst, including the *Simpson* prior art catalyst, but they recognized the presently claimed catalyst as having significantly improved properties, as documented in the journal article. Other customers have similarly adopted the improved catalyst, which has enjoyed significant sales, amounting to millions of dollars, since its introduction.

The Office further acknowledges that *Simpson* does not refer to solubility of the impregnant components or precursors, but that "*Simpson* discloses a carbonate impregnant, identified by applicant as insoluble." The Office further emphasizes that

Simpson identifies the carbonate "as a **soluble** material." (Emphasis in the original) Applicant has previously provided a standard reference (the Merck Index) that clearly establishes that the identified metal carbonates are substantially water insoluble. Additional evidence based on the standard reference, "CRC Handbook of Chemistry and Physics" is quoted directly in the application as filed (paragraph [0048]). As a matter of scientific fact, the statement in *Simpson* is simply wrong.

On page 4 of the Office Action there are contradictory arguments regarding the instant claim limitation relating to a "Group VIII metal component (which) is provided by a substantially water insoluble component" vis-à-vis the disclosure of *Simpson* and the Office's view of the significance of the quoted limitation.

On the one hand, the Office states that "any impregnant would have been obvious in this process, however, because the significance of selection cannot be determined and as long as the material is stably dispersed in the impregnating solution (it) would be expected to function as desired, i.e. to deposit the metal on the carrier." To begin with, this statement disregards Applicant's evidence of improved performance of the catalyst produced by its process versus that of the prior art as represented by *Simpson*. Additionally, *Simpson* doesn't refer to stable dispersion of an insoluble Group VIII component; it refers only to components that are soluble or rendered soluble by the use of relatively high concentrations of phosphoric acid. Reference to a stably-dispersed, partially insoluble component adopts Applicant's invention as if it were the prior art. Furthermore, when a component is not present as a soluble component in the composition, its interaction with and deposition on the carrier is necessarily different than when it is totally soluble. Therefore, even if that component is eventually solubilized, its presence in a mixture prior to

becoming soluble changes its interaction with the other metal components. When it is finally solubilized in the present invention by using temperatures typically greater than those in *Simpson*, the interaction of all of the metal components with one another and with the carrier occurs under different conditions.

Thus, it can be seen that the conclusory statement by the Office that "the solubility of the substance (the Group VIII metal) in water is really not relevant as long as it is soluble or can be dispersed to some degree in the final impregnant solution." (Emphasis in the original) As discussed above, this opinion of the Office fails to consider the potential intermediate effect, and it fails to take into account that the catalysts produced by the methods of the present invention exhibit improved performance.

Repeating its statement used in the earlier Office Action, the Office concludes that "both references teach this to be the final result." "Accordingly, such limitation would not appear to lend patentable moment to the process under consideration." The process of the invention has been discussed above because it is relevant to understanding the full scope of Applicant's invention. Expressed very simply, Applicant has demonstrated a different result based on use of his improved catalyst, components for preparing the catalyst and processes for preparing it. Failing to consider the overall improvement achieved by the present invention and merely citing similar features does not fairly address Applicant's advance.

Additionally, the claims have been amended to introduce a limitation that reflects the use of an insoluble active metal component, which amendment distinguishes the present claims from the teachings of *Simpson*. As discussed above, *Simpson* requires the use of sufficient phosphoric acid in order to solubilize the Group VIII metal salt from the outset. Thus the interaction of the metal salts in solution is different

from the interaction of a Group VIII metal salt slurry with a solution containing a Group VIB metal salt and phosphoric acid, which composition is subsequently heated to effect solubilization. Respectfully, the present claims are distinguished from *Simpson* and the application should be passed to allowance.

In the last paragraph on page 4 of the current Action, the Office addresses the issue of the uncalcined carrier. The Office states that *Simpson* discloses "an embodiment wherein ... all the precursors are comulled to avoid multiple calcinations." (*Id.*, column 8) The Office asserts that such a composition would appear to be substantially the same as that under consideration.

Simpson's disclosure of this alternative embodiment appears to be mere "boilerplate" disclosure, a gratuitous recognition of the prior existence of the comulling method. *Simpson* does not explain how such a method can be applied to his invention and still achieve the "unusually narrow pore size distribution" that is said to characterize that invention or whether it is even possible to do so; in fact, *Simpson* does not apply the comulling method to his invention in any example.

Applicant does not assert to have invented the comulling method, but rather that when it is applied as a feature in the process of his invention, along with the specific compositional elements that are set forth, the resulting catalyst is significantly improved. As stated in *Simpson*, that invention is directed to a catalyst having support particles with "an unusually narrow pore size distribution." (Col. 4, lns. 34-36, emphasis supplied) In contrast, comulling produces agglomerated carrier particles that, after further processing, result in macropores as disclosed in the present application (paragraph [0055]. This condition introduces a broadening of the pore distribution due to the existence of macropores and is

contrary to *Simpson's* invention. This feature is further discussed in the Petroleum Technology Quarterly journal article identified above at page 42, col. 1, wherein it is noted that large pores and very large pores, 200Å-1000Å and >2000Å, are effective in allowing diffusion of the asphaltene molecules into the catalyst and cracking of them with minimum sediment formation. The very narrow pore size distribution *Simpson* catalyst is clearly distinguished from the catalyst of the present invention, particularly as represented by the instantly amended claims.

As previously stated in earlier responses to the Office, the present application states, "although differences in the methods and compositions used to prepare such catalysts (of the present invention) may be considered small compared to those described in the prior art, the catalyst resulting from these changes performs significantly better in hydrocarbon conversion processes than catalysts prepared according to prior art methods." (Paragraph [0070], page 28) These improvements are clearly demonstrated by the data shown in the examples and figures of the present application. Thus, the Office recognizes that *Simpson* does not anticipate the instant claims, but the Office treats the differences between the instant claims and *Simpson* as being obvious and of no "patentable moment." Applicant takes exception to such an analysis and conclusion since Applicant has demonstrated the cumulative effect of the differences versus the prior art. Also as noted in the journal article cited above, the cumulative effect of these changes compared to prior art catalyst has been an improvement worth "\$400,000-\$500,000 per month" at just one commercial facility since introduction of the improved catalyst in 2004. (Page 47, last sentence; emphasis added) While there are some similarities and overlapping subject matter, the specific combination of features in the present claims is not fairly

taught or suggested in *Simpson*. Withdrawal of this rejection is respectfully requested.

As it is believed that all of the rejections set forth in the Official Action have been fully met, favorable reconsideration and allowance are earnestly solicited.

If, however, for any reason the Examiner does not believe that such action can be taken at this time, it is respectfully requested that the Examiner telephone Applicant's attorney at (908) 654-5000 in order to overcome any additional objections which the Examiner might have.

If there are any additional charges in connection with this requested amendment, the Examiner is authorized to charge Deposit Account No. 12-1095 therefor.

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Respectfully submitted,

By 

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